IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, ex rel, W.A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA, et al.	)	
Plaintiffs,	)	
V.	)	No. 05-CV-329-GKF-SAJ
TYSON FOODS, INC., et al.,	)	
Defendants.	)	

REPORTER'S TRANSCRIPT OF PROCEEDINGS

MARCH 10, 2008

PRELIMINARY INJUNCTION HEARING

VOLUME VII

BEFORE THE HONORABLE GREGORY K. FRIZZELL, Judge

APPEARANCES:

For the Plaintiffs: Mr. Drew Edmondson
Attorney General
Mr. Robert Nance
Mr. Daniel Lennington
Ms. Kelly Hunter Burch
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Glen R. Dorrough
UNITED STATES COURT REPORTER

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March 10, 2008

THE COURT: What's on the agenda today, gentlemen?

MR. PAGE: Your Honor, I have a minor housekeeping matter, if I may.

THE COURT: Yes, sir.

MR. PAGE: Your Honor, David Page, for the State of Oklahoma.

THE COURT: Yes, sir.

MR. PAGE: Friday on cross-examination of Dr. Hennet, I failed to ask for admission of four exhibits.

THE COURT: Yes, sir.

Q. Are you familiar with the journal Water Research?
A. I am. And Jorge Santa Domingo, the lead author here, is a friend of mine. We've done a lot of source tracking work together.
Q. So you find this to be a competent and well-respected journal?
A. It is a good journal, yes.
Q. The researcher, in fact, is a person of competence based on your knowledge of him?
A. That is true.
Q. And isn't he with the EPA in their research lab?
A. Yes, he's in the Cincinnati office of research and development.
Q. Would you read the first sentence under introduction, please, sir?
A. "Poultry farming is a worldwide practice of meat production that has significantly increased in the last few decades."
Q. Now, would you skip over to the next column to the right there and begin reading where it says, "As a result"?
A. Sure. "As a result of this increase in production, fecal matter has become a significant byproduct of the poultry industry which in many cases has been used as fertilizer in the form of raw or composted manure. Central risks arising from the disposal of poultry fecal waste is the spread of enteric

pathogens such as 0157, Salmonella, Campylobacter and viruses. These pathogens can reach watersheds after rainfall events and thereby increase risk associated with recreational use of waterways."

Q. Do you agree or disagree with the statements made by Dr. Domingo that you just read?

A. Oh, these statements, I think, are the introduction to setting up the work that they are trying to take a look at in --

Q. No, they're introductory, they give the foundation for the research. But do you agree or disagree with those statements that Dr. Santa Domingo presents?

A. I would agree with the majority of it. However, again, with the 0157, I don't think you're going to find much 0157, if ever 0157 in poultry litter.

Q. Okay. Now, I want you to turn to the conclusions. And would you read beginning under conclusions on page 3572 of the article, Dr. Santa Domingo's conclusion.

A. Certainly.

THE WITNESS: Your Honor, I have never seen this. May I have a minute just to take a look at it?

THE COURT: Absolutely.

MR. JORGENSEN: With that, Your honor, that he's never seen it, I object to foundation.

THE COURT: Overruled.

IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,

Plaintiff,

vs. 4:05-CV-00329-TCK-SAJ

TYSON FOODS, INC., et al,

Defendants.

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VOLUME I OF THE VIDEOTAPED DEPOSITION OF CHRISTOPHER TEAF, PhD, produced as a witness on behalf of the Defendants in the above styled and numbered cause, taken on the 30th day of July, 2008, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Lisa A. Steinmeyer, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.

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Q None of them did?
A Didn't call out cattle, didn't call out chickens, didn't call out anything. They called out agriculture and the '08 is more specific.
Q They also call out unknown, don't they? 01:01PM
A They do.
Q And are you -- I haven't seen the 2008 list quite frankly. Are you telling me that for all of these stretches, that for the 2008 list that poultry is listed as a cause of the impairment? 01:01PM
A No. Land application of waste is included.
Q For all of --
A Category 59.
Q For all of these?
A Yes. 01:01PM
Q And you're telling me you're unaware as to whether the Attorney General of the State of Oklahoma had any influence over whether or not or the inclusion of poultry as an influence in those creeks? 01:02PM
A Yes, sir, I am telling you that. I don't have that knowledge.
Q What do you know about the die-off rate of bacteria that is contained in chicken litter?
A There are a number of studies that have looked 01:02PM

at that, and they have been interesting in that they have shown die-off some cases initially, some cases not, but they reach a plateau, and at least several of the studies show actual regrowth in the environment following original die-off, which complicates greatly in my view the question of whether these things really are attenuated or not. 01:02PM

Q Can you quickly go to your relied on list or your bibliography publications and selected abstracts that would be correct, where we find those studies? 01:02PM

A No. You find them in Attachment A to my report.

Q The specific question is die-off rates. Show me the ones that impact on the question of bacterial die-off rates for bacteria that's in chicken litter. 01:03PM

A Okay. Just a moment. Begins on Page 18 at Paragraph 35. The articles are by Crane.

Q C-R-A-N-E?

A Yes, et al, 1980. 01:06PM

Q Okay.

A I believe Coyne and Blevins.

Q 1995?

A Yes.

Q Okay. 01:07PM

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,

Plaintiff,

vs. 4:05-CV-00329-TCK-SAJ

TYSON FOODS, INC., et al,

Defendants.

- -

VOLUME II VIDEOTAPED DEPOSITION OF TIMOTHY J. SULLIVAN, Ph.D., produced as a witness on behalf of the Plaintiffs in the above styled and numbered cause, taken on the 8th day of April, 2009, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Karla E. Barrow, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.

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Q And why is that?
A Well, as I mentioned yesterday, based on the Wade report, it would be the indicator value that was most closely correlated with incidences of gastrointestinal distress. It's a commonly used indicator. It -- as opposed to fecal coliforms, it was not recommended by EPA to not use it. As compared to Enterococci, it's not above the standard at almost every water that's been evaluated in Oklahoma based on the analyses that I was able to perform. So it would have more of a chance of providing some useful information, I think, in this evaluation. 09:04:03 09:04:18
Q Do the waters of the Illinois River watershed in Oklahoma exceed water quality standards for E. coli? 09:04:29
MR. BOND: Object to the form.
A Can you restate that, please?
Q (By Ms. Burch) Do the waters of the Illinois River watershed in Oklahoma exceed water quality standards for E. coli? 09:05:05
MR. BOND: Object to the form.
A There are waters in Oklahoma that exceed the standards for fecal indicator bacteria. I'm not sure if E. coli is exceeded or fecal coliforms or 09:05:15

Enterococci or a combination of those. There are waters that are stated or documented by the State of Oklahoma to have exceeded those criteria, but I'm not sure specifically which ones. Some of that is on a map in my report. 09:05:28

Q (By Ms. Burch) Are you speaking with reference to the map of waters listed as impaired on the 303(d) list?

A Yes.

Q Separate from the analysis of the 303(d) list, did you do any evaluation of whether E. coli, fecal coliform and Enterococcus levels exceed water quality standards in the waters of the Illinois River in Oklahoma? 09:06:05

A Yes. There are maps that show individual sampling site locations in Oklahoma, and there are bars on those maps. The height of the bar is proportional to the concentration of the E. coli -- I think the question is specifically E. coli; right? 09:06:14

Q My question was with regard to all three. 09:06:25

A Okay, for all three. So there are -- the height of the bar in each case is proportional to the concentration of the bacterial parameter, and the color of the bar indicates whether it was above the geomean standard or below the geomean standard. 09:07:04

are orange, indicating that they're above the standard for Enterococcus, which is 33 colony forming units per hundred mil.

Q On Figure 2-6, were you looking only at EPA STORET data? 09:09:22

A For that particular figure I was looking at EPA STORET data. But if you go the next figure, that's Water Resources Board, Oklahoma Water Resources Board which shows the same thing again for Enterococcus, and if you go to the following figure, 09:09:29 2-8, that shows the U.S. Geological Survey Data, and in that case we have a number of orange bars that are above the standard, and those are, as the figure legend indicates, those are -- well, it doesn't indicate. Well, what the figure legend indicates is 09:10:10 that there are relatively few sites in Oklahoma, and then there are other analyses in the report where I indicate what I believe to be the main reason why there are some high values in Oklahoma, which has to do with the times of flow conditions under which 09:10:19 USGS collected those samples.

Q Okay. Let's look at these individually. Figure 2-6 deals with geomean concentrations of Enterococcus; is that correct?

A 2-6 is geomean Enterococcus from EPA STORET 09:10:28

database.
Q And do you notice -- do you identify a number of exceedances of the geomean standard for Enterococcus in the Illinois River watershed?
A Based on EPA STORET database, in the Illinois River watershed, most of the samples are above -- maybe all of them are above the 33 CFUs per hundred mils criterion, which is -- yes, that's correct. 09:11:09
Q And it looks like it -- well, first, how did you calculate the geometric means reflected on Figure 2-6? 09:11:26
A The geometric means would have been calculated by Todd McDonald in my office. And they were calculated using the statistical software that he was using for analyzing the data. 09:12:06
Q Do you know whether for each of the bars on this map you had five samples during a 30 day period?
A Yes. The figure legend indicates five or more samples during the period from 2000 through 2007, and during the time frame May 1 to September 30th, that's the time period for which the water quality standard is applied. 09:12:14
Q I think we talked about yesterday that the geometric mean standard requires five samples within 09:12:22

a 30 day period; is that correct?
A For the purposes of evaluating whether or not a body of water exceeds or does not exceed the standard, that is the way that it's done. For the purposes of evaluation what the data looked like, 09:13:01
that's generally not the way it's done because there are -- in many cases or most cases, there are not five samples available within a 30 day period from very many locations. So if you want to get a sense
of spatial patterns in bacteria, you generally 09:13:11
cannot restrict your analyses to a 30 day period because you won't have enough data points to see the spatial patterns. So this map was not intended to be used to -- by the State for determining 303(d)
listings and whether or not a water body met or did 09:13:19
not meet a standard. This was done for the purpose of evaluating what the spatial patterns in Enterococcus are within the state of Oklahoma, and doing the same thing for the other bacterial
indicators, as well. 09:13:26
Q So for any particular bar on Figure 2.6, can I determine whether or not the geometric mean Enterococcus level exceeds the water quality standard?
A Yes. By the color you can determine whether 09:14:07

the geomean concentration that was calculated from the available data of five or more samples was above or below what that standard value is, which is, in this case, 33 CFUs per hundred mil, but that's not the same as deciding -- being the State and deciding is it exceeding or not exceeding and the purpose of a 303(d) listing, that's a different -- that's a regulatory issue. This is a data analysis issue. 09:14:17

Q Where do I go to determine the source of the data that you used to generate these bars? Let me rephrase the question. Where do I go to evaluate your analysis of the data? 09:14:32

A Well, you would go to EPA STORET online and subset Enterococcus of all the locations with five or more samples during the period 2000 through 2007 supplement -- or subset to the dates May 1 to September 30th, eliminate the duplicates, and run the analyses. 09:15:12

Q I mean in your considered materials. Did you set forth in your considered materials the samples that you identified to calculate each of the bars on Figure 2.6? 09:15:20

A I asked my data analyst to provide to the lawyers in this case copies of everything that I saw. So if they analyzed data and I saw them, then 09:16:01

they were provided to the lawyers.
Q Do you know whether -- whether the particular samples used to calculate those bars on Figure 2.6 were in fact provided to the lawyers?
A I don't know because that's not what I asked my data analyst to provide. What I told them was that my understanding of what was being asked of us, of me, was that materials that I considered in forming my opinions and in writing my report needed to be provided to the lawyers in this case. And so what I asked them to do, each one of them, was, if you got data and I saw it, then we need to provide it to the lawyers. 09:16:10 09:16:18
Q Okay.
A And as far as I know, that's what was done. 09:16:25
Q Would you turn your attention to Figure 2-7? Are those the geometric mean Enterococci concentrations which you calculated based on Oklahoma Water Resources Board data?
A This is data from the Oklahoma Water Resources Board, the geomean of five or more samples at an individual location, restricted to the periods May 1 through September 30th, and the years 2000 through 2007. 09:17:06
Q Did you have five data points within 30 days 09:17:14

for each of the bars on this map?
A Well, there may have been some bars that had five data points within 30 days, but again, because this was not an analysis for determining regulatory compliance and 303(d) listing by the State but rather an analysis of what are the spatial patterns of bacteria indicators in Oklahoma, there was no need to subset to a 30 day period, and it was my judgment that if, in fact, I had done that, I would have very few data points and would not be able to identify the spatial patterns, so that's not -- that's not what I did. But there may be some of these that, in fact, do have five or more samples in a 30 day period. I'm really not sure. 09:17:23 09:18:04
Q I noticed on Figure 2-7 and 2-6, when I look at the boundary of the Illinois River watershed, I don't see any data points for the part of the watershed that's in Arkansas. Why is that? 09:18:11
A Well, this was -- this series of maps is a spatial evaluation of fecal indicator bacteria, and there are phosphorus maps, as well, within the state of Oklahoma. I was evaluating questions such as are the fecal concentrations within the IRW in Oklahoma somehow different than they are -- or unusual, different or unusual as compared with the rest of 09:18:18 09:18:32

the state. So this was not a comparison with the Arkansas portion with the rest of the state because the lawsuit, as I understand it, is a lawsuit by Oklahoma, so I assumed that Oklahoma would be more interested in how different or similar the fecal indicator bacteria values within the IRW in Oklahoma may be compared to the rest of the state of Oklahoma. 09:19:09

Q Why would you assume that the State would be interested in that? 09:19:16

A Well, one of the claims that was -- that came through to me listening to the testimonies in the preliminary injunction hearing was the claim by a number of the consultants for the plaintiffs in this case that the concentrations of fecal indicator bacteria inside the IRW in Oklahoma were somehow alarming, a cause for great concern. I mean that's -- they asked for a preliminary injunction against litter spreading because they claimed that it was a major concern, something needed to be done about it right away. So my emphasis was to evaluate, well, are the concentrations inside the IRW really that different from the rest of Oklahoma, because I didn't see any presentation from the plaintiffs' consultants in the PI hearing that would 09:19:25 09:20:06 09:20:15

suggest that they even looked at that, so I did.
Q And why is it that you think that the bacteria levels in the Arkansas part of the Illinois watershed are not of interest to the State of Oklahoma? 09:20:22
A I don't know whether they're of interest to the State of Oklahoma or not, but again, what I was trying to do with this map was to answer, first for my own curiosity, and secondly, to provide as a presentation in this case an analysis that would 09:20:32 tell me are the -- Oklahoma filed the lawsuit, they asked for a preliminary injunction partly or largely because of bacteria. So my question was, well, are the bacteria concentrations in the IRW in Oklahoma of such magnitude that the State would be justified 09:21:10 in having such a level of concern, and these maps would suggest to me the answer is no.
Q Did you do any analysis that would compare the level of bacteria in Arkansas, the Arkansas part of the Illinois River watershed to levels across the 09:21:20 state of Oklahoma?
A I'm sorry, can you restate that?
Q Did you do any analysis comparing fecal coliform bacteria levels in the Arkansas portion of the Illinois River watershed to levels across the 09:21:28

state of Oklahoma?
A Compare Arkansas to Oklahoma. I don't think I did that. I don't remember -- I don't remember doing that.
Q When I look at Figure 2-8, I think we were talking earlier about it being an analysis of the Enterococcus data from USGS. To me, it appears to be an analysis of fecal coliform levels and -- is that correct? 09:22:03
A It is an analysis of fecal coliforms, and if I stated that it was Enterococcus, then I apologize. And the USGS actually did not collect Enterococcus. I think that there were a few samples in more recent years, but there were -- well, for the period analyzed here, 2000 to 2007, there were, I believe, no Enterococcus data for the state of Oklahoma from the USGS, or if there were, there were so few data points that we were not able to some treat them out. 09:22:14 09:22:24
Q Okay. Let's look at Figure 2-8. Is that -- well, let me go back. Did any of the analysis in Figure 2-6 or 2-7 evaluate the single sample water quality standard for Enterococcus? 09:23:03
A I'm sorry, can you restate the question again for those two, Enterococcus?
Q Did any of the analysis presented on Figure 09:23:12

2-6 or Figure 2-7 evaluate the single sample for Enterococcus as compared to the rest of the state?

A There are analyses that evaluate that within Oklahoma at Tahlequah in the report, but these two figures, these two maps that you're asking about, were analyses of the geomean, not analyses of the single standard, so there are five or more samples in each case. And to tell you the truth, I don't remember if the Enterococcus standard is 10 percent or a single standard. I'm not sure. But the analysis here is the geomean, and thank you for pointing out the 2-8, so what I said about Enterococcus was incorrect, because in all cases in this series, I go through the fecal indicator bacteria one by one for the three different data sources, but I was not able to do that with Enterococcus with USGS because there was not the data to do it with. And so I misspoke earlier when I testified about Figure 2-8 when I said it was Enterococcus, when, in fact, it was fecal coliforms. 09:23:25 09:24:07 09:24:18 09:24:27

Q I don't know if it's possible to spend any time on this or not, but Figures 2-8 through 2-17, can you look at those and tell me whether the calculations that led to the bars on those figures were done any differently from the figures we just 09:25:17

discussed, Figure 2-6 and Figure 2-7?
A The calculations would have been done in the same manner.
Q And by the same person?
A Yes. 09:25:28
Q What was that person's name again?
A Todd McDonald.
Q Figure 2-8, is that a calculation of geomeans for fecal coliform based on USGS data?
A Figure 2-8 is geomean fecal coliforms, sites with five or more samples during the time period of 2000 through 2007, and the months -- the days May 1 through September 30th. 09:26:13
Q And Figure 2-9 would be the calculation, the geomean fecal coliform levels based on EPA STORET data? 09:26:24
A Yes, it's based on EPA STORET.
Q And then Figure 2-10, that calculation of fecal coliform concentration is based on what -- Oklahoma Water Resources Board data? 09:27:03
A Yes, it is.
Q Did you combine those figures into one figure?
A Yes.
Q Is that represented on Figure 2-16?
A Figure 2-16 is the geomean fecal total 09:27:16

coliforms, again, five or more samples during the same time periods, and it includes USGS, STORET and Oklahoma Water Resources Board data combined.

Q In comparing that Figure 2-16 to Figure 2-8, USGS fecal coliform analysis. 09:27:32

A Uh-huh.

Q The bars on Figure 2-8 look much higher than the bars on 2-16. Is that -- if 2-16 includes the USGS, wouldn't the bars be the same height?

A Well, they would be if the scales were the same. The scales on maps of this sort are adjusted to show the range of values on the map. You don't want to have bars that are so tall they go off the map, and you don't want bars that are so short that you can't see them, so you adjust the bars depending on the concentrations for the mix of data across the graph. That's why we provide scale bars, for that reason. And that's also a major reason why I wanted to color these green versus orange so that it would make it easier to see which sites were above versus below the standard value. 09:28:13 09:28:22 09:29:01

Q It's difficult to tell for sure, but on Figure 2-16, inside the Illinois River watershed, it looks like there are five points where you show exceedances of the geomean? 09:29:10

A I'm sorry, which figure?
Q Figure 2-16.
A Figure 2-16, inside the IRW. I can see -- I can see five. There may be some behind other ones, but I can see five on the figure visually. 09:29:19
Q And referring back to 2-8, I see 1, 2, 3, 4, 5, 6; do you?
A On Figure 2-8, I see five clearly, and I see the hint of one -- what I believe is the hint of one behind one, and that -- because the scale is 09:30:03 presented on Page 2-16 with the bars being smaller, my suspicion is that it's behind it and we can't see it on 2-16, but I would have to go back and look at the individual data to confirm that.
Q Okay. Figure 2-11, is that the geometric mean 09:30:17 calculations for E. coli that you did based on USGS information?
A Figure 2-11. Let's see. Figure 2-11 is USGS data, E. coli, the same time periods we've been talking about elsewhere. 09:31:02
Q And is Figure 2-12 the geomean, the E. coli calculations that you did based on EPA STORET data?
A Figure 2-12 is EPA STORET.
Q And Figure 2-13, is that the calculations that you did for geomean E. coli concentrations based on 09:31:14

the Water Resources Board data?
A Figure 2-13 is Water Resources Board, E. coli.
Q And were those three figures combined on any figure in your report?
A Let's see. E. coli. I see E. coli from three data sources on Figure 2-17. 09:31:26
Q And that -- I just want to make it clear. Is that combining the analysis from 2-11 through -- let me make sure, 2-11, 2-12 and 2-13?
A That would be combining the data in 2-11, 2-12, and 2-13, yes. 09:32:13
Q Looking at Figure 2-17, it appears to me there are a number of exceedances of the E. coli standard throughout the Illinois River watershed. Is that the way you interpret this? 09:32:32
A You're asking about 2-17?
Q Yes.
A There are a number of sites on Figure 2-17 inside the IRW that had the geomean of the five samples during that time period that were colored as orange, indicating that they were above the geomean standard. 09:33:09
Q Based on this analysis that you did, do you see widespread violations of the E. coli standard in Oklahoma? 09:33:19

A No, no, these data would not allow me to determine that.
Q Why is that?
A Because to determine if there's a violation of the standard, that's where you're required to analyze samples collected within a 30 day period, and that restriction was not placed on this because it's a spatial analysis for the state, as we discussed before. 09:33:25
Q Were you able to do that for the bio -- for the bars that are located within the Illinois River watershed? 09:34:03
MR. BOND: Object to the form.
A I don't understand the question.
Q (By Ms. Burch) Were you able to calculate 30 day geometric means based on five samples during a 30 day period for the bars located within the Illinois River watershed? 09:34:09
A I didn't attempt to do that, but my impression is from discussing the quantity of data that we had with Todd, that there would be so few data points anywhere in Oklahoma, that that was not a spatial analysis that would be very helpful for the purpose of doing what I set out to do here and what we've already discussed. It was not the intention to try 09:34:15 09:34:23

to determine whether or not the State of Oklahoma should list any of these waters as impaired for E. coli or any other constituent. That's something that Oklahoma does, and they list them as impaired if they should be listed as impaired, I would assume, but that's not what I was trying to do here. 09:35:06

Q So I'm trying to determine as well, the bars that are on Figure 2-17 located within the Illinois River watershed, do you know whether those geometric means were calculated using all of the available data from 2000 to 2007? 09:35:16

A No, they were collected using the data during the period May 1 through September 30th, the years 2000 through 2007, any location that had five or more samples available during those -- the constraint of those time periods. 09:35:25

Q And just so -- I'm struggling to understand exactly what was done. Just take the highest bar in the Illinois River watershed; do you see that?

A Yes. 09:36:04

Q Do you know what that location is?

A Yes, it's directly adjacent to the sewage lagoon at Watts, Oklahoma.

Q Okay.

A You are on Figure 2-17; right? 09:36:12

Q Why did you not include the STORET data in this analysis?
A I would have to check for sure. My guess is that there were no STORET data at Tahlequah, but I would have to check on that. 10:02:21
Q Are there a number of values on these figure -- this figure indicating that E. coli concentrations exceed water quality standard?
A Well, the E. coli -- there are the two E. coli standards, so for the geomean standard, you can't 10:03:13 evaluate one way or the other without knowing that your samples at a given location were collected within a 30 day period. For the individual sample standard, then on the bottom graph, it shows that 235 CFUs per hundred mil standard that's applicable 10:03:24 to portions of the Illinois River, those being the high use areas, I don't know if Tahlequah is included in the high use area part of the Illinois River or not. It might be. So I would say to be able to answer the question for sure, I would need 10:04:06 to know if Tahlequah was in that high use area. But there are, it looks like two samples that are -- that are above, under low and moderate flow, and then there are multiple samples. Well, I can say for sure that some of those would be above, even if 10:04:21

it's not -- even if the 235 isn't applicable, so yes, there are some.

Q Looking at this figure, it shows, it looks like, three data points indicating concentrations above roughly 9,000 CFU per 100 milliliter; is that correct? 10:05:06

A Let's see. Yes, that's correct.

Q And there's a line on there that indicates high flow at approximately that level; is that correct? 10:05:17

A No, that would be incorrect, and I apologize if I set this figure up in a way that was confusing. I think I explained it in the legend, but it may be more difficult to understand simply looking at the figure. The high flow is the area that's shaded gray on both panels of the figure. That would be the top 30 percent of flows based on the long-term record, so above the 70th percentile of daily long-term flows. That's what's being labeled as high flow, and then the area -- the area that's white is the flows below the 70th percentile. So 70 percent of the flow conditions -- of the daily flow conditions would be in the white zone, and the 30 percent that are the highest flows would be in the gray zone. And the gray zone looks bigger because 10:05:25 10:06:05 10:06:17

A I did something like this for Watts, and I presented that, I believe, in the preliminary injunction hearing. I think it would just be Watts and Tahlequah would be the only places.

Q Did you use the same 70th percentile cutoff value for high flow at Watts? 10:21:20

A Yes.

Q Would you turn to Figure 10-2?

A Yes.

Q It looks like these are E. coli geomeans by year and fecal coliform geomeans by year looking at USGS data at Tahlequah; is that correct? 10:21:32

A Correct.

Q Now, this data does not analyze the Water Resources Board, the STORET or the State's data; is that correct? 10:22:15

A That's correct.

Q When this -- when you do this analysis, are there a number of violations of the geometric mean standard identified for E. coli and fecal coliform? 10:22:25

MR. BOND: Object to the form.

A No, based, as we've discussed a number of times here, that a violation of a standard is based on five or more samples collected over a 30 day period. This was not an attempt to evaluate whether 10:23:04

or not any standard was violated, this was an attempt to evaluate the patterns and the data.

Q (By Ms. Burch) Just so I understand, looking at the -- would I call this a figure or a graph?

A Either one is correct. 10:23:14

Q Looking at the figure for E. coli geomeans, it looks like there's a dot right above 2000 and it has the number 11 above it?

A Yes.

Q And there's a dot beside it that has the 10:23:22 number 12 above it?

A Correct.

Q Going back to the dot with 11, is that a geomean calculation using 11 samples collected during the year 2000? 10:23:28

A Yes.

Q And the same would be true of the other dots, then, that they are collected during the year, and a geomean calculated based on all of the samples collected during that year? 10:24:07

A The number of samples for each data point, for each dot, is indicated above the dot. I tell how many samples under the calculations, so I didn't exclude any data on this graph. I showed all the USGS data that were collected at Tahlequah by year, 10:24:14

is that called?

A Period of record.

Q Thank you.

A Yes. And can I clarify on something earlier you asked me what the period of record was, and I said I thought it was somewhere between 30 and 50 years, and it says here 1980 to 2008, so it would be 28, so I misspoke by a little bit last time. 10:26:29

Q Okay. Thank you. I'm not sure if you'll recall this, but earlier when we were discussing single sample comparisons, you indicated in your report there's a comparison of single sample standards at Tahlequah in your report; is that correct? 10:27:09

A I indicated that there was a comparison. What do you mean by there's a comparison? Can you clarify? 10:27:16

Q I'm not sure I can. I think when we were talking about whether or not you had done any comparison of single sample values for bacteria in the Illinois River watershed to the state as a whole, and I thought that you said you had done some kind of comparison at Tahlequah and it was reflected in your report. 10:27:22

A I think what I said was that on some of my 10:28:01

graphs I showed the location of that -- of that criteria value, the single sample criteria value, and that's actually been on some of the graphics we've already gone over, so there are presentations in my report that show that. This one doesn't show that, but there are presentations that do. 10:28:10

Q Do any of the presentations regarding single sample values at Tahlequah compare the levels to levels in other places in Oklahoma?

A A direct comparison between Tahlequah and other places in Oklahoma. Well, yes. If you go back to that whole series of maps with the bars, the green and orange bars sticking up, if you go to the maps and find the Tahlequah location on those maps, then you can make the comparison that you're looking for. 10:28:20 10:28:29

Q Now, I thought that those bars represented geometric mean concentration?

A That's right. So is your question specific to individual samples? 10:29:06

Q Yes.

A I can't think of any place in my report that it would allow you to do that. I don't think that there is.

Q Okay. Did you do that type of analysis? 10:29:10

A I didn't do any analyses where I was trying to compare any particular site anywhere, one site, one sample, with patterns in Oklahoma. I don't believe so.

Q Did you do any analysis to compare single sample values for bacteria throughout the Illinois River watershed to single sample values in other parts of Oklahoma? 10:29:18

A I'm sorry, I don't understand the question.

Q Did you do any analysis comparing single sample bacteria concentrations in the Illinois River watershed -- 10:29:29

A Uh-huh.

Q -- to single sample bacteria concentrations in the rest of the state of Oklahoma? 10:30:05

A No.

Q Did you do any analysis of the influences on water quality in the Illinois River watershed?

MR. BOND: Object to the form.

A Well, I think a large part of my report discusses various aspects of the influences of water quality. So I think the majority of my report, a lot of it, at least, is focused on influences of water quality. 10:30:19

Q And how did you attempt to identify sources of 10:30:27

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,	)
Plaintiff,	)
vs.	) 4:05-CV-00329-TCK-SAJ
TYSON FOODS, INC., et al,	)
Defendants.	)

- -

THE VIDEOTAPED DEPOSITION OF ROBERT LAWRENCE, M.D., produced as a witness on behalf of the Defendants in the above styled and numbered cause, taken on the 23rd day of July, 2008, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Lisa A. Steinmeyer, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.

EXHIBIT
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they convened to research panel to address the fact that the water standards have come under criticism and perhaps needed to be updated, and I believe in that document, there's some reference to this question as being one of the reasons that the 1984 standards have been criticized. 02:08PM

Q I don't remember what the exact statement was in the 2007 EPA pronouncement, but there was something in there that indicated some uncertainty or at least there was some controversy? 02:08PM

A Yes.

Q The same thing is true of -- for the World Health Organization as late as, what, 2004 or so?

A Yes.

Q Do you recall what it was -- 02:08PM

A No.

Q -- that the WHO said?

A I do have the -- I do have that WHO material in the considered materials.

Q Okay, and do you simply discount those -- 02:08PM let's call them questions raised by both the EPA and WHO -- as to whether these indicator bacteria are valid?

A I don't discount them, but the law is the law, and we have EPA standards we're expected to follow, 02:09PM

and until they're changed, I think we have to abide by the law.

Q I take it you've not done any personal work regarding the efficacy of these indicator bacteria standards when the waste is animal; you've not been personally involved in that work? 02:09PM

A Not personally, no.

Q Has the Bloomberg School been involved in that?

A Yes, there's several efforts. The whole field of bacteriology is really undergoing another major see change in terms of new technologies, and I think what probably is going to ultimately lay to rest this controversy will be of genetic fingerprinting and actual, you know, that kind of precision, and 02:09PM 02:10PM there are people at the Bloomberg School who are working in that area of genetics.

Q How long do you think it will be before that expertise is sufficiently advanced to where we'll be able to fingerprint precisely, you know, whether or not -- well, to end this controversy? 02:10PM

A I would be speculating. I hope it's soon. I mean I think the rate at which things are unfolding, an educated guess, but I would emphasize the guess, but maybe within five to ten years. 02:10PM

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

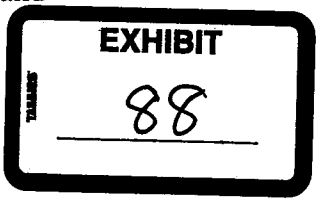
STATE OF OKLAHOMA,	)	
	)	
Plaintiff,	)	
	)	
v.	)	**Case No. 05-cv-329-GKF(PJC)**
	)	
TYSON FOODS, INC., et al.,	)	
	)	
Defendants.	)	

DECLARATION OF VALERIE J. HARWOOD, Ph.D.

I, Valerie J. Harwood, Ph.D., hereby declare as follows:

1. My terminal degree is a Ph.D. in Biomedical Sciences from Old Dominion University & Eastern Virginia Medical School in Norfolk, VA (1992). From 1992 to 1995 I held a full-time postdoctoral research position at the University of Maryland Center of Marine Biotechnology. In 1995 I joined the Department of Natural Sciences at the University of North Florida as a tenure-track Assistant Professor, where I taught microbiology and related courses, and maintained a research laboratory until I joined the University of South Florida (USF) in Tampa, FL in August 1998. Since that time I have been employed by USF in the Department of Biology (now the Department of Integrative Biology) in a full-time position. In 2004 I was promoted to Associate Professor, which is my current rank, and was awarded tenure. My responsibilities at USF include teaching undergraduate and graduate courses in microbiology, mentoring undergraduate and graduate research students, and maintaining an active research program. My research laboratory personnel currently include one technician and six Ph.D. students. My research focuses on microbial water quality, with particular emphasis on microbial source tracking (MST), a field of environmental microbiology that seeks to determine the source of fecal contamination in water by identifying specific molecular signatures in the DNA of fecal microorganisms.

2. I have worked in the field of environmental microbiology since 1986, and in the area of MST since 1997. I am the author of 34 peer-reviewed journal articles and



three peer-reviewed, published reports, twelve of which are directly related to MST. One of these articles has been cited in other peer-reviewed publications 121 times to date (100 citations is an important benchmark that few papers reach). Other publications include over 30 technical reports, a book chapter, and substantial contributions to the U.S. Environmental Protection Agency Microbial Source Tracking Guide Document. I am also co-editor of a book on microbial source tracking that is contracted to be published by Springer Scientific Press in 2010, and I have been an invited speaker on water quality research and MST over 50 times across the U.S., in the U.K. and in New Zealand. I am a reviewer for many scientific journals including Environmental Science & Technology, Environmental Microbiology, and Journal of Applied Microbiology, and am a member of the editorial review board of Applied & Environmental Microbiology. I have served on state and federal grant panels including Sea Grant, National Oceanic and Atmospheric Administration (NOAA) and the United States Department of Agriculture (USDA), and have been awarded over $3 million in grant funding from various agencies including the National Science Foundation, NOAA, Sea Grant, USDA, United States Environmental Protection Agency (USEPA) and National Institutes of Health. My current funding for MST and related environmental microbiology research totals over one million dollars from agencies including the Florida Department of Environmental Protection, the Water Environment Research Foundation, the US Department of Agriculture and the US Environmental Protection Agency.

3. I have studied the defendants' Motion for Summary Judgment on Plaintiffs' RCRA Claim in the Case that Is Before the Court. My expert opinion described herein applies to "Undisputed Fact 33: Plaintiffs tested water samples in the IRW for various types of bacteria that can cause human illness ("pathogenic bacteria") but found no *campylobacter* and only extremely infrequent and low levels of *salmonella*." My opinion is that *Campylobacter* and *Salmonella* were infrequently detected in the Illinois River and its tributaries for three major reasons, as outlined below and detailed in succeeding paragraphs:

- Culture-dependent methods, which are not able to detect physiologically stressed pathogens, were utilized for the analyses;
- Relatively small sample sizes were utilized for the analyses;

- The relatively long hold time between sample collection and the initiation of testing contributed to die-off of bacteria in the samples that may have been culturable.

4. Pathogens can be very difficult to detect in the environment, particularly in water samples where they are diluted (National Research Council, 2004). Furthermore, pathogens such as *Campylobacter* and *Salmonella* are adapted for the high-nutrient, constant temperature environment of a host's gastrointestinal tract. Once excreted to the external environment they are exposed to nutrient deprivation, temperature fluctuations, ultraviolet light and other pressures that lead to a physiologically stressed condition. Such conditions tend to make standard, culture-based methods ineffective. As stated by the National Research Council (2004):

> 'Typical culture methods for pathogen and indicator bacteria in water and other environmental samples greatly underestimate the true concentrations of viable and potentially infectious cells—sometimes by as much as a thousandfold."

5. Conventional methods for detecting pathogens in food, fecal and water samples rely upon culturing, which means the organisms are grown in broth and/or on solid media that are designed to select for the desired target organism and to discourage the growth of non-target organisms. While these methods reliably detect pathogens that are healthy, such as those in clinical samples from infected patients, the conditions used to select for the target pathogen can inhibit the growth of stressed, but viable (living) pathogens. The response of many bacterial pathogens to such stress is to enter a "viable but nonculturable" (VBNC) state (Oliver, 2005). In this state pathogens are metabolically active ("living"), but they cannot be cultured on media routinely used for their isolation. Many studies have indicated that pathogens which enter the VBNC state remain infectious (Baffone et al., 2003; Oliver & Bockian, 1995), including *Campylobacter jejuni* (Baffone et al., 2006) and *E. coli* O157:H7 (Makino et al., 2000). *Salmonella* is also known to become VBNC under environmental stress (Oliver, Dagher & Linden, 2005). Due to the ability of many pathogenic bacteria to become VBNC, testing for pathogens based on the use of culture-based methods alone is likely to yield false-negative results (negative test results when pathogens are actually present) (Skovgaard, 2007). The ability of VBNC pathogens to be revived (resuscitated) in a host means that

infectious pathogens can be present in samples that test negative by culture methods alone (Baffone et al., 2003; Oliver, 2005; Oliver & Bockian, 1995). The use of polymerase chain reaction (PCR) and the development of culture-independent methods in the study of pathogenic bacteria has led to an enhanced ability to detect pathogens in environmental samples, due in part to the sensitivity of culture-independent methods toward VBNC organisms (Skovgaard, 2007).

6. In our study, culture-dependent methods were used to detect *Campylobacter* and *Salmonella,* in part because such methods are "standard methods," and also because a microbiologist with knowledge of molecular biology methods was not present in the planning stages of the study. As explained above, the pathogens in water samples were likely to be physiologically stressed, and would not be detected by culture-dependent methods.

7. Sample volumes of 100 ml or less were analyzed. When pathogens enter a water body they are immediately diluted, and analysis of large sample volumes (e.g. 500 ml or more) increases the probability of detecting pathogens (Hanninen et al., 2003; Harwood et al., 2005).

8. Due to lack of a reliable analytical laboratory with proximity to the study site, samples were shipped on ice by overnight freight to analytical laboratories. The vast majority of these samples began their analysis within 24 to 30 h of sample collection, nevertheless, the die-off of a portion of microorganisms held in this manner frequently occurs (The Public Health Laboratory Service Water Sub-Committee, 1953).

9. Because the detection of pathogens in recreational waters is so challenging and prone to false-negative results (failure to detect pathogens when they are in fact present), indicator bacteria such as *E. coli* and enterococci are used by the State of Oklahoma and the U.S. Environmental Protection Agency to gauge the safety of water for human use (State of Oklahoma, 2006; U.S. Environmental Protection Agency, 1986; U.S. Environmental Protection Agency, 2000). The survival of closely-related indicators and pathogens, like *E. coli* and *Salmonella,* has been shown to be well correlated in environmental waters (Rhodes & Kator, 1988). Elevated indicator bacteria levels in the Illinois River and its tributaries have led to a number the waters' designation of "impaired" over a major portion of the watershed. Elevated indicator bacteria levels have

been shown to be correlated with the risk of gastroenteritis (caused by *Campylobacter* and *Salmonella,* among other pathogens) in many studies (Cabelli et al., 1979; Fleisher et al., 1998; U.S. Environmental Protection Agency, 1986; Wade et al., 2003).

10. Please note that my opinions in this matter are my own, and do not reflect an official view of the University of South Florida.

I declare under penalty of perjury, under the laws of the United States of America, that the foregoing is true and correct.

Executed on the 1st day of June, 2009.

Valerie J. Harwood

Valerie J. Harwood, Ph.D.

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How to Safely Enjoy Oklahoma's Scenic Rivers

Oklahoma's Scenic Rivers are the state's most popular destinations for canoeing, kayaking, and other outdoor water activities. Because of the importance of Oklahoma's Scenic Rivers, they are frequently tested by several agencies and other organizations. Information taken from this testing indicates there are times when levels of bacteria in the water exceed the Environmental Protection Agency's recommended standards for human contact. The rivers do not exceed EPA recommended standards on a daily basis, but exceedances occur often enough that people using the river should take some precautions.

Below are Some Recommendations on How to Safely Enjoy Oklahoma's Scenic Rivers...

- Shower with soap & water after swimming.
- Wash cuts & scrapes with clean water and soap after swimming.
- Hold nose or wear nose plugs when jumping into water.
- Wear ear plugs.
- Wear swim goggles.
- Take children to the restroom frequently.
- Use swim diapers on infants.
- Stay away from any area that has floating debris, oil sheens or dead fish.
- Don't swim after a heavy rain.
- Don't swim in water with a temperature greater than 80°F (If the water does not feel cool when you first enter it, then it is likely greater than 80°F).
- Don't swim if you have cuts or scrapes.
- Don't swim near storm drains.
- Don't swim in stagnant (unmoving) water.
- Don't swim in water with a green surface scum.
- Don't ingest water.

Oklahoma Scenic Rivers Commission

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
...for a clean, attractive, prosperous Oklahoma

OFFICE OF THE SECRETARY OF ENVIRONMENT AIR LAND WATER State of Oklahoma

EXHIBIT 89

Transcript of the Testimony of VALERIE J. HARWOOD, Ph.D.

1/29/2008

W. A. DREW EDMONDSON, et al.
vs.
TYSON FOODS, INC., et al.

4:05-CV-00329-TCK-SAJ

TULSA FREELANCE REPORTERS
610 S. Main St., Ste. 210
Tulsa, OK 74103
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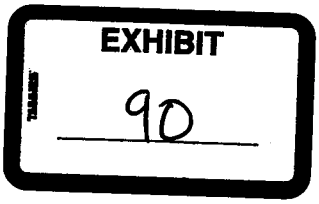

people have been drinking water straight out of the ground in the IRW without any treatment whatsoever during the last 50 years?

MR. PAGE: Object to the form.

THE WITNESS: I don't know. I don't have those numbers at my fingertips. 03:31PM

Q (By Mr. Elrod) Can you identify or can any expert on the State of Oklahoma's expert panel identify any person, any single person who has become ill as a result of drinking that water over the last 50 years? 03:31PM

MR. PAGE: Objection.

THE WITNESS: Again, that's not something that we need to try to do to establish the risk.

Q (By Mr. Elrod) Well, Doctor, if there's a risk and there are literally tens of thousands of people who have been drinking water from the ground over the last 50 years and you can't identify one person who's gotten sick, how can you say that there's a risk? 03:31PM 03:32PM

A The risk comes from the known association of fecal bacteria, especially those from high-risk sources with the risk of gastroenteritis. I mean there is a distinct and definite correlation there that's well documented. 03:32PM

Q And the same question to you, Doctor, regarding water body contact in the IRW in the streams and tributaries of the Illinois River. Can you identify any person who has become sick as a result of water body contact in the IRW? 03:32PM

A So, again, it goes along to the same line of reasoning, that it's difficult to identify the people, people who become sick from the -- from water body contact, so we use indicator organisms as surrogates for human health risk. 03:32PM

Q Have you read Dr. Caneday's affidavit? He's the leisure time Ph.D.

A No, I have not.

Q Doctor, I believe his testimony attempted to quantify the amount of person hours of body water 03:33PM contact in the Illinois River, and my recollection is, subject to whatever it actually says, is something in the range of a million five hundred thousand human hours of body contact over the last several years. And again, the question is after all 03:33PM of that water body contact in the Illinois River, do you know whether the State of Oklahoma can identify one person who has become sick as a result of water body contact in the watershed?

A That would be the same answer, the risk is 03:33PM

there.

Q And, Doctor, when you identify risk, and that risk never results in harm, doesn't that call into question the original estimate of the risk?

MR. PAGE: Objection. 03:33PM

THE WITNESS: The risk does and will result in harm. It's simply something that is very difficult to quantify in the human population.

Q (By Mr. Elrod) It's also difficult to find, isn't it, in this case? 03:34PM

A The -- in all cases, epidemiology studies that I have been involved with in surface water literally have to enroll five to 10,000 subjects. So it's a difficult undertaking and expensive.

Q Well, there are certainly more than five to 10,000, quote, subjects, end quote, living on a daily basis in the IRW; isn't that true? 03:34PM

A Yeah. But for an epidemiology study, you have to divide them up into cohorts and limit their exposure and you have to ask questions and follow-ups. So it's not simply a question of whether they go in the water or not but the controlled conduct of that study is what has to be done. 03:34PM

MR. ELROD: Thank you, Doctor. 03:34PM

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF OKLAHOMA

UNITED STATES OF AMERICA, Plaintiff, v. SEABOARD FOODS LP and PIC USA, INC., Defendants.	Civil Action No._____

COMPLAINT

The United States of America, by authority of the Attorney General of the United States and through the undersigned attorneys, acting at the request of the Administrator of the United States Environmental Protection Agency (EPA), files this complaint and alleges as follows:

I. BRIEF STATEMENT OF THE CASE

1. This is a civil action brought against Seaboard Foods LP ("Seaboard") and PIC USA, Inc. ("PIC") for appropriate relief, including injunctive relief and civil penalties, for violations of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6901 et. seq., at various concentrated animal feeding operations ("CAFOs") in Oklahoma that are now owned and/or operated by Seaboard and were, at the time the relevant contamination of soil and ground water began, owned and operated by PIC.

2. The United States seeks to enjoin Defendants to comply with an Administrative

EXHIBIT 91

Order issued by EPA on June 26, 2001 (the "AO"), in order to abate an imminent and substantial endangerment to public health, welfare, and the environment connected with the contamination of soil and groundwater at five named farms (the "Order Farms") in Oklahoma. The United States also seeks civil penalties for Defendants' violations of the AO, pursuant to Section 7003(b) of RCRA, 42 U.S.C. § 6973(b), and such other relief as the Court may deem appropriate.

II. JURISDICTION, AUTHORITY, NOTICE AND VENUE

3. This Court has jurisdiction over the subject matter of this action pursuant to Section 7003(a) of RCRA, 42 U.S.C. § 6973(a) and 28 U.S.C. §§ 1331, 1345 and 1355.

4. Venue is proper in this judicial district pursuant to Section 7003(a) of RCRA, 42 U.S.C. § 6973(a) as this is a judicial district in which Seaboard and PIC are doing business and within which many of the United States' claims arose. See 28 U.S.C. §§ 1391(b)-(c) and 1395.

5. Notice of the commencement of this action and of the filing of the complaint has been given to the State of Oklahoma pursuant to section 7003(a) of RCRA, 42 U.S.C. § 6973(a).

III. DEFENDANTS

6. Defendant Seaboard is a corporation organized under the laws of the state of Oklahoma with its principal place of business located at 9000 West 67th Street, Shawnee Mission, Kansas 66201. Among other things, Seaboard is engaged in the business of breeding and raising swine on large scale concentrated animal feeding operations in Oklahoma, Colorado, Kansas and Texas. Seaboard is the current owner and operator of all five Order Farms subject to the AO, as those terms are defined at 40 C.F.R. § 260.10.

7. The five Order Farms are as follows:

a) Lacey 1 (a.k.a. Bryan Sow & Norris Farms; S62; F436), located in Kingfisher County, Oklahoma;

b) Lacey 3 (a.k.a. Watson; F424), located in Kingfisher County, Oklahoma;

c) Lacey 4 (a.k.a. Grimes Finisher; F425), located in Kingfisher County, Oklahoma;

d) Lacey 6 (a.k.a. Miller: F426) located in Kingfisher County, Oklahoma; and

e) Fairview Nursery Complex (Fairview Nurseries 1-4) (F155-158), located in Major County, Oklahoma.

8. Defendant PIC is a corporation organized under the laws of the state of Delaware with its principal place of business located at 100 Bluegrass Commons Blvd., Suite 2200, Hendersonville, Tennessee 37075. PIC is the former owner and operator of all five Order Farms.

9. Seaboard and PIC are "persons" as defined at Section 1004(15) of RCRA, 42 U.S.C. § 6903(15).

IV. RELEVANT STATUTORY PROVISIONS

10. RCRA Section 7003, 42 U.S.C. § 6973, provides in pertinent part:

> [U]pon receipt of evidence that the past or present handling, storage, treatment, transportation or disposal of any solid waste or hazardous waste may present an imminent and substantial endangerment to health or the environment, the Administrator may bring suit on behalf of the United States in the appropriate district court against any person (including . . . any past or present owner or operator of a treatment, storage, or disposal facility) who has contributed or is contributing to such handling, storage, treatment, transportation, or disposal to restrain such person . . . [or] to order such person to take such other action as may be necessary, or both . . . ."

11. A "solid waste," is defined by Section 1004(27) of RCRA, 42 U.S.C. § 6903(27), as, "any... discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations..."

12. Swine effluent that has been over-applied on fields or otherwise permitted to leach into ground water, such as from a leaking lagoon, barn, or other infrastructure such as piping, is a "discarded material" from "agricultural operations" and thus is a "solid waste" as defined by Section 1004 (27) of RCRA, 42 U.S.C. § 6903 (27).

13. The authority to make a determination that an imminent and substantial endangerment exists has been delegated from the Administrator of EPA to the Regional Administrator by EPA Delegation Nos. 8-22-A and 8-22-C, dated May 11, 1994 and No. 8-23, dated March 6, 1986.

14. Section 7003(b) of RCRA, 42 U.S.C. § 6973(b), authorizes the Administrator to bring a civil action to enforce any order of the Administrator under Section 7003(a) and to assess civil penalties against any person who willfully violates, or fails or refuses to comply with such order.

15. The Court may assess civil penalties of up to $5,500 per day for violations of an Administrative Order issued under RCRA occurring after January 30, 1997, and civil penalties of up to $6,500 per day for such violations after March 16, 2004. See 42 U.S.C. § 6973(b), the Federal Civil Penalties Inflation Adjustment Act of 1990, Pub. L. No. 101-410, 104 Stat. 890 (1990) (28 U.S.C. § 2461 note), *amended by* Pub. L. No. 104-134, § 31001(s)(1), 110 Stat. 1321-373 (1996) (28 U.S.C. § 3701 note), 61 Fed. Reg. 69,360 (Dec. 31, 1996) and 69 Fed. Reg. 7121 (Feb. 13, 2004).

V. FACTS GIVING RISE TO LIABILITY

A. Background Facts

16. Swine produce considerable amounts of nitrogenous organic waste, typically in the

range of 6 to 8 pounds of manure per 100 pounds of weight per day. Each of the five Order Farms uses one or more waste storage lagoons, many of which are more than an acre in size. Each lagoon is connected to one or more barns, and each barn contains approximately one thousand (1,000) swine. Swine manure, urine, and other waste products fall through a grate in the barn floor into a shallow, slurry pit underneath. The pits are drained periodically into the lagoons where the waste is stored until it is later disposed of on fields owned or leased by Seaboard.

17. Swine effluent concentrations of ammonia and nitrate can be considerable, as ammonia is produced by hydrolysis of waste fluids. Due to their high solubility, ammonia and nitrate can readily leach into ground water. Where aerobic conditions are present, such as is typical in a surficial aquifer, ammonia will be converted to nitrite and then nitrate.

18. The EPA has determined that nitrate poses an acute health concern at certain levels of exposure. Nitrate in drinking water is colorless and odorless. Ingestion of nitrate, converted to nitrite in the body, interferes with the oxygen carrying capacity of blood, potentially resulting in cyanosis and, at higher levels, asphyxia. High levels of nitrate in water can also cause a blood disorder in infants known as methemoglobinemia ("blue baby syndrome") that can be fatal if left untreated.

19. Defendants apply waste from the lagoons onto crop fields, primarily using two types of irrigation systems: a center pivot irrigation sprinkler, which sprays out lagoon waste while the overhead sprinkler slowly rotates around a center point, and a hard hose system, sometimes in conjunction with a center pivot, whereby an employee sprays lagoon waste from a hose and attempts to evenly distribute it over the field. Seaboard typically applies lagoon waste to fields

growing primarily grass or hay, which absorb nitrogen and other nutrients in the waste.

20. Plants can uptake nitrate and nitrite in limited qualities. Quantities of nitrate and nitrite in the soil in excess of concentrations which can be used by plants may migrate to the water table where they can adversely impact ground water quality and its use as a drinking water source. Migration to the water table may also occur where sandy soils cannot hold the nitrate and nitrite in the root zone for a sufficient amount of time to allow for the crops' natural uptake process.

B. EPA's Findings

21. The SDWA requires the EPA to publish maximum contaminant level goals (MCLGs) for contaminants that may have an adverse effect on the health of persons and that are known or anticipated to occur in public water systems. MCLGs are to be set at a level at which no known or anticipated adverse effects on the health of persons would occur and which allow a margin of safety. 40 C.F.R. § 141.2. At the same time the EPA publishes an MCLG, it must also promulgate a National Primary Drinking Water Regulation which includes either (1) a maximum contaminant level (MCL) or (2) a required treatment technique. An MCL must be set as close to the MCLG as feasible taking into account economic feasibility of drinking water systems. The MCLG and MCL for nitrate under the National Primary Drinking Water Regulations are 10 mg/L as nitrogen. 40 C.F.R. § 141.62. The EPA has established this drinking water standard to protect against the adverse effects of nitrate, including potential effects on sensitive populations.

22. At each of the Order Farms, EPA found ground water contamination in excess of the MCL for nitrate, as follows:

a) ground water downgradient of the Lacey 1 Farm contained nitrate

concentrations up to 57.6 mg/L;

b) ground water downgradient of the Lacey 3 Farm contained nitrate concentrations up to 70.7 mg/L;

c) ground water downgradient of the Lacey 4 Farm contained nitrate concentrations up to 93.5 mg/L;

d) ground water downgradient of the Lacey 6 Farm contained nitrate concentrations up to 66.6 mg/L; and

e) ground water downgradient of the Fairview Nursery Complex contained nitrate concentrations up to 49.2 mg/L.

23. Based on the above evidence, in 2001, EPA determined that the past and present handling, storage, treatment, and disposal of a solid waste (i.e., manure effluent) at the Order Farms by Defendants may present an imminent and substantial endangerment to health or the environment, including contamination of underground sources of drinking water near the Order Farms and the Cimarron River and North Canadian River.

C. Defendants' Failure to Comply with the RCRA 7003 Administrative Order

24. On June 26, 2001, EPA issued an Administrative Order pursuant to RCRA 7003(b), 42 U.S.C. § 6973(b), Order No. RCRA-06-2001-0908, to Seaboard Farms, Inc. (now Seaboard Foods LP) and PIC International Group, Inc., concerning the Order Farms. The Order requires the Defendants to identify, investigate, and prevent the mishandling of any solid waste which may present an imminent and substantial endangerment to human health and/or the environment and to ensure that remedial action deemed necessary by the EPA be designed and implemented to protect human health and/or the environment.

25. Specifically, the Order requires the Defendants to: (1) perform a Field Analysis (FA) to fully determine the nature and extent of any release(s) of solid waste at or from the Facilities; (2) perform remedial Procedures Analysis (RPA) to identify and evaluate alternatives for remedial actions(s) to prevent or mitigate any release(s) of solid waste at or from Facilities, and to collect any other information necessary to support the selection of remedial procedures at the Facilities; and (3) implement the remedial procedure or procedures (Remedial Procedures Implementation (RPI) selected by the EPA for facilities.

26. Respondents failed to comply with the Order in various ways, including by failing to characterize all sources of contamination, particularly land application source areas, as required by Paragraph 77 of the Order; by failing to determine the magnitude, horizontal and vertical extent, direction, and rate of movement of solid waste constituents in the ground water as required by Paragraphs 76 and 77 of the Order; and by failing to submit to EPA a Field Analysis Report, in accordance with requirements contained in the Remedial Action Plan, as required by Paragraph 80 of the Order.

VI. CLAIM FOR RELIEF:

FAILURE TO COMPLY WITH EPA'S RCRA 7003 ORDER

27. Paragraphs 1 through 26 of this Complaint are incorporated herein by reference.

28. Defendants Seaboard and PIC have willfully violated, or failed or refused to comply with, the AO issued by EPA to them on June 26, 2001, pursuant to Section 7003(a) of RCRA, 42 U.S.C. § 6973(a), requiring cleanup and other actions to abate the imminent and substantial endangerment to health or the environment.

29. Pursuant to Section 7003(b) of RCRA, 42 U.S.C. § 6973(b), Defendants are liable

for civil penalties of up to $5,500 per day for violations of an Administrative Order issued under RCRA occurring after January 30, 1997, and civil penalties of up to $6,500 per day for such violations after March 16, 2004. See 42 U.S.C. § 6973(b), the Federal Civil Penalties Inflation Adjustment Act of 1990, Pub. L. No. 101-410, 104 Stat. 890 (1990) (28 U.S.C. § 2461 note), *amended by* Pub. L. No. 104-134, § 31001(s)(1), 110 Stat. 1321-373 (1996) (28 U.S.C. § 3701 note), 61 Fed. Reg. 69,360 (Dec. 31, 1996) and 69 Fed. Reg. 7121 (Feb. 13, 2004).

30. Pursuant to Section 7003(a) of RCRA, 42 U.S.C. § 6973(a), Seaboard and PIC are subject to an injunctive order to restrain them from contributing to the imminent and substantial endangerment, to take such other action as may be necessary, or both.

PRAYER FOR RELIEF

WHEREFORE, based on the allegations contained herein, Plaintiff, the United States of America, requests that the Court enter judgment for the United States and against Seaboard and PIC, as follows:

1. Order Defendants to comply fully and completely with the Administrative Order, taking all actions necessary to abate the imminent and substantial endangerment identified by the EPA;

2. Assess civil penalties of up to $5,500 per day for violations of the RCRA AO occurring after January 30, 1997, and civil penalties of up to $6,500 per day for such violations after March 16, 2004, pursuant to Section 7003(b) of RCRA, 42 U.S.C. § 6973(b);

3. Grant the United States its costs and disbursements in this action; and

4 Grant such other and further relief as the Court deems appropriate.

Respectfully Submitted,

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Division

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IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF OKLAHOMA

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
v.	)	
	)	
SEABOARD FOODS LP, and	)	Civil No.
	)	
PIC USA, INC.,	)	
	)	
Defendants.	)	

CERTIFICATE OF SERVICE

I hereby certify that on September 14, 2006, I electronically mailed the Complaint and Civil Cover Sheet in the above-captioned matter to the Clerk of Court, and mailed by United States mail the Complaint to the following individuals:

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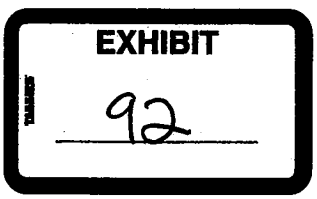
IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,	)
Plaintiff,	)
vs.	) 4:05-CV-00329-TCK-SAJ
TYSON FOODS, INC., et al,	)
Defendants.	)

- -

VOLUME I OF THE VIDEOTAPED DEPOSITION OF DENNIS COOKE, PhD, produced as a witness on behalf of the Defendants in the above styled and numbered cause, taken on the 4th day of December, 2008, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Lisa A. Steinmeyer, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.



A I recall Mr. Page's instruction, don't delete anything, and I didn't.
Q Dr. Cooke, do you consider yourself to be a microbiologist?
A No. 08:49AM
Q Do you consider yourself to be a toxicologist?
A Well, if you're asking -- may I ask -- understand what this question is about?
Q Well, you know what a toxicologist is, don't you? 08:50AM
A I do.
Q Okay. I mean, do you have any training in that field?
A I have written substantially about toxicology related to disinfection byproducts, so, yes. 08:50AM
Q You consider yourself to be an environmental engineer?
A I have done a lot of work with environmental engineering, so, yes.
Q Do you consider yourself to be a sanitary 08:50AM engineer?
A No.
Q You're not a medical doctor, obviously, are you?
A No. 08:50AM

21st of 2007 before you started working on THMs again?

A I don't know. It had to have been shortly thereafter because we had a final report written by the first week or so of January of '08, and this is at the end of September. So somewhere in that next three months and it had to be very shortly because it took a heck of a lot of work to get the THM report done. 01:36PM

Q Is it your opinion, Dr. Cooke, that there's a problem or will be a problem with disinfection byproducts in the Illinois River watershed or Lake Tenkiller? 01:36PM

A There currently is a problem, and I think it will get worse as -- unless poultry waste is stopped, it's going to get worse because there's going to be more loading and more algae production, and that's going to create more problems in these water plants, a lot more problems. So, yes, I think it will get worse unless there's a cessation of poultry waste disposal. 01:37PM

Q Is that the basis for your opinion?

A I'm sorry?

Q Let me ask it this way: Did you just state all the opinions you have regarding disinfection 01:37PM

byproducts as they relate to the IRW in Lake Tenkiller?

MR. PAGE: Object to the form.

Q Is that what you just told me; is that your opinion? 01:37PM

A I have more opinions than that.

Q Okay. What are the other ones?

A I wonder if we could get a structured question; otherwise, I'll start reading the text to you. I don't know what -- 01:37PM

Q Have you put all your opinions about DBPs in your written report?

A I have. I have stronger opinions now than I had when I wrote the report.

Q Why? 01:38PM

A More information.

Q What information?

A Mainly information from the periodical literature, and let me see if I can explain that. When you look at the disinfection byproduct reports 01:38PM that come from ODEQ, what you see is that in various quarters these utilities are in excess, and sometimes 20 or 30 percent of them are way in excess, especially on THMs, and then in a subsequent quarter, their numbers are back down again, and so 01:38PM

the running four-quarter average shows that they're not out of compliance because that's the basis for determining in or out of compliance is the average you have on a running four-quarter basis, but the more I thought about this and began to look at 01:38PM
periodical literature in this regard, and we'll be providing you a list of some of those reports if they're not already in here, is that there is a very definite link between drinking water that has disinfection byproducts in it at a level near but 01:39PM
below the EPA threshold, a definite link between drinking that water and spontaneous abortions, meaning that this is short-term exposure that would cause that since the gestation time is nine or fewer months for humans, meaning that these one-quarter 01:39PM
exceedances might alone be enough to provide that kind of embryo toxic environment.

There are not very many people at some of these drinking water plants. They have customers that are less than -- a number of customers less 01:39PM
than a thousand, but some of them are quite high, and Tahlequah would be an example of that. So then it -- and I don't have that very statement that I just gave you regarding spontaneous abortions in here. This just took additional thinking and an 01:40PM

additional look at the literature.

Q Well, where -- you talking about literature you looked at?

A Yes.

Q Where is that literature from? 01:40PM

A Published -- periodical literature published in peer-reviewed journals.

Q What journals?

A Epidemiology is a journal. Journal of Public Health. You know, I have these in my briefcase, and 01:40PM that's about the best I can tell you.

Q In your briefcase with you today?

A They may be there with you. As I said earlier this morning, we'll provide you with a list of the very articles I'm referring to. 01:40PM

Q When did you review those things?

A In the last month to six weeks.

Q Have you turned them over to the lawyers for the State of Oklahoma?

A Yes. 01:41PM

Q When?

A Yesterday.

Q What investigations or what investigation have you done, Dr. Cooke, to determine the extent, if any, of spontaneous abortions in the State of 01:41PM

Oklahoma?

A I have not done any. I don't understand why Oklahoma women would be any different than California and Nova Scotia and some of the other sites where this has been reported. The sample site is so large that I feel it's fair to extrapolate to other humans. 01:41PM

Q Can you tell me what periodicals or studies that you are referring to?

A As I mentioned in a previous answer to that question, Epidemiology is one. That's the name of a journal. 01:41PM

Q What else?

A I believe the Journal of Public Health but, like I say, if I could say this just one more time, I'll provide you this list. I could do it by tomorrow if you'd like to have it. 01:42PM

Q Would you agree, Dr. Cooke, that these studies are not all accepted or not accepted in all quarters as being valid? 01:42PM

A No.

Q Do you agree or disagree with that?

A I would disagree with that. I have no information to believe that they're not accepted.

Q How deep have you dug on that? 01:42PM

A I've tried to read as much as I can get, and with my kind of background and the background of any scientist, you look at the sample size and the methods that they used and then see if you agree with the conclusions. 01:42PM

Q Is it your testimony under oath that you've not seen anything or read anything that indicates there's significant disagreement among the medical research community about this?

A I have not made this statement. I can find one article that disagrees with that. 01:42PM

Q What article is that?

A It's an article written by two individuals, Savitz and Singer.

Q Who are they? 01:43PM

A Both of them work I believe at the University of North Carolina. I can't identify their specific departments in that university, but they did a study, a smaller sample size, but their conclusion was that they couldn't find a relationship but their sample size was smaller but, sure, there's that kind of disagreement. 01:43PM

Q Has the Environmental Protection Agency, Dr. Cooke, altered its DBP thresholds that are allowed as a result of any of these studies that you've 01:43PM

looked at?

A Not to my knowledge. These studies are new; in some cases they're new. You see, the threshold that we work under with regard to DBPs, all of us, have more to them than just the toxicological impact of DBPs. EPA had to set these on the basis of obtainability relative to cost and to engineering possibilities, and so these numbers, 80 for THM, 60 for haloacetic acids are compromises. 01:44PM

Q Well, we'll come back to that in a minute. Is the State of Oklahoma in your opinion failing to protect its citizens with regard to disinfection byproducts? 01:44PM

A I think they probably could pay more attention to it. I wouldn't say they are failing. They're following the letter of the law. 01:44PM

Q But the question is, are they failing to protect its citizens with regard to DBPs? That's the question.

A I'll have to give you the same answer. They're following the letter of the law and if -- the regulation, and if those regulations are failing to protect Oklahomans, then they're failing to protect everybody in the United States. 01:44PM

Q Have you evaluated the reporting of 01:45PM

trihalomethane concentrations for the IRW water treatment facilities?

MR. PAGE: I'll object to the form.

A Yes. Have I evaluated them?

Q Uh-huh. 01:45PM

A I certainly have reported them in a report about them, yes.

Q Which facilities have you evaluated?

A There's 18 in Oklahoma along the lakeshore and on the river, and we got reports from all of them. 01:45PM

Q Who gave you those reports or how did you get your hands on them I guess is my question?

A They came from the ODEQ and were obtained for me from Michelle Garber, who is a toxicologist working for Dr. Teaf. 01:46PM

Q What did you find in there in those reports?

A Well, there were a few utilities, excuse me, that reported no exceedances at all. All of the rest had some exceedances, and some a lot more than others, and so that's how I reported it was by the 01:46PM number of exceedances and near exceedances that each of the utilities had over the span of time that they reported.

Q Isn't it true, Dr. Cooke, that you didn't find -- that you found that there were actually very 01:46PM

few problems with THMs in tap water from the lake or the river?

A Well, few is certainly a subjective number. In some of the utilities, exceedances over the span of reporting time would be 20 or 30 percent of their reports. I don't call that few. And some of them, I will say, there were very few reports, maybe one or two or zero. That would probably be considered few. 01:47PM

Q I'll hand you Defendant's Exhibit No. 12 and ask you to take a moment to look at that, if you would, Doctor. 01:47PM

A Okay.

Q The bottom of the page there's an E-mail that looks like you wrote to Roger Olsen on September 9th of 2007; is that correct? 01:48PM

A Yes.

Q And the subject was query about THAA and TTHM; is that right?

A Uh-huh. 01:48PM

Q Okay. Would you read into the Record the portion that I've highlighted in yellow?

A From what little I can see, parenthesis, historical, plus '05, '06, there are few problems with THMs in tap water from the lake or the river. 01:48PM

United States Environmental Protection Agency predict at the standard of 80 micrograms per liter?

MR. PAGE: Object to the form.

A Very difficult question to understand. They're not predicting a health risk at 80 micrograms. What they are saying is that disinfection byproducts are strongly associated with certain types of cancers and with embryo toxic effects. So they drew the line at 80 based in part on health risk and based in part on costs and attainability of getting it any better, that is, getting DBPs any lower in finished drinking water. So the number 80 for DBP -- for THMs and 60 for haloacetic acids is essentially a compromise number and is not entirely based upon health risk. 02:07PM 02:08PM 02:08PM

Q Are you suggesting that the EPS not protecting the health of the citizens of this country?

MR. PAGE: Object to the form.

A Well, off the Record I'd say 100 percent true but that's not -- 02:08PM

Q Well, you're on the Record.

A I'm on the Record. Yes, I'll say that now, but that has everything to do with air quality and water quality.

Q Did you determine, Dr. Cooke, whether the 02:09PM

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,

Plaintiff,

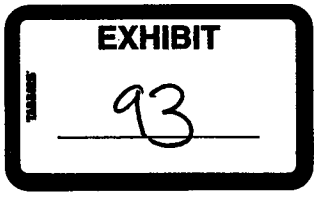
vs. 4:05-CV-00329-TCK-SAJ

TYSON FOODS, INC., et al,

Defendants.

- -

VOLUME II OF THE VIDEOTAPED DEPOSITION OF MICHAEL McGUIRE, PhD, produced as a witness on behalf of the Plaintiff in the above styled and numbered cause, taken on the 19th day of March, 2009, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Kristen Holmes, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.



have to make a decision whether or not to use three of the four quarters or try to find four quarters to average, and so we just did the best we could following the guidance of the rule to determine those running annual averages, some of which are based on three quarters. 08:58AM

Q So based on the -- your analysis of RAAs, is it accurate that you identified six public water supplies in the Illinois River watershed that had exceedances of the TTHM and HAA5 MCLs during the period of record that you analyzed the data? 08:59AM

A No. It looks like five. Our calculation is based on five. We did not find actually an exceedance of the RAA for Sequoyah County Water Association, which is the mystery that we talked about before. 08:59AM

Q I see. So there are five public water supplies that you identified violations at; is that correct?

A That exceeded the MCL, yes. 09:00AM

Q And -- and then DEQ has identified one additional, which is Sequoyah County Water Association; is that correct?

A Yes.

Q Okay. Are you familiar with the Stage 2 09:00AM